

[0043] FIG. 11 is a flowchart explaining a method for controlling operations of a fuser according to an embodiment of the present disclosure.

DETAILED DESCRIPTION

[0044] Reference will now be made in detail to the embodiments, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to like elements throughout. The embodiments are described below to explain the present disclosure by referring to the figures.

[0045] Prior to specifically explaining the present disclosure, the method of disclosing the present specification and the drawings will be explained below.

[0046] First of all, the words used in the present specification and in the claims were selected from generally used terms in consideration of the functions of various embodiments of the present disclosure. However, the meanings of these words may vary depending on the intentions of one skilled in the art, technical interpretation, and advent of a new technology. Furthermore, some of the words herein may have been randomly selected by the applicant of this specification. These words may be interpreted to mean as defined in this specification, and unless there are specific definitions, they may be interpreted based on the overall disclosure of the present specification and the general technical common sense of one skilled in the art.

[0047] Furthermore, like reference numerals in the drawings refer to like parts or components that perform substantially the same functions. For the sake of easy understanding an explanation, like reference numerals will be used in different embodiments as well. That is, even if like reference numerals are used in a plurality of drawings, it does not necessarily mean that all the drawings belong to the one same embodiment.

[0048] Furthermore, words that include ordinal numerals such as “the first” and “the second” may be used to differentiate between the components in this specification and in the claims. These ordinal numerals are used to differentiate between the same or similar components, and thus the use of such ordinal numerals is not intended to limit the meanings of the words. For example, the order of use or order of arrangement of a component combined with such an ordinal numeral shall not be limited by that ordinal numeral. When necessary, the ordinal numerals may be exchanged between one another.

[0049] Unless mentioned otherwise, any singular expression includes a plural expression. In the present application, words such as “include” or “consist of” are used to designate that the characteristics, numbers, steps, operations, components, parts or a combination thereof disclosed in the present specification exist, but not to exclude the possibility of existence or addition of one or more of other characteristics, numbers, steps, operations, components, parts or a combination thereof.

[0050] Furthermore, in an embodiment of the present disclosure, a part being connected to another part includes the part being connected to the another part indirectly via another medium. Furthermore, a part including another component means that any other component may also be further included unless mentioned otherwise.

[0051] Hereinafter, an embodiment of the present disclosure will be explained in further detail with reference to the drawings attached.

[0052] FIG. 1 is a block diagram illustrating a simplified configuration of an image forming apparatus according to an embodiment of the present disclosure.

[0053] Referring to FIG. 1, an image forming apparatus 100 according to the present embodiment consists of a fuser 110 and fuser driver 200. Such an image forming apparatus 100 may be a printer, scanner, copy machine, facsimile, or an MFP (Multi Function Peripheral) configured to provide all the functions of a printer, scanner, copy machine, and facsimile through one apparatus.

[0054] The fuser 110 fuses printing paper on which a toner has been developed. More specifically, the fuser 110 applies heat and pressure to the printing paper to fuse the electrified toner on the printing paper. Such a fuser 110 may include a heating roller and pressurizing roller.

[0055] The heating roller may be heated to a predetermined temperature, and heat the printing paper so that the electrified toner on the printing paper may be easily fused.

[0056] Such a heating roller has a heating element (for example, heater lamp) for heating a heating roller to a predetermined temperature. There may be one heating element or a plurality of heating elements in the heating roller. Such a heating element may be heated by the power provided from a fuser driver 200 that will be explained hereinafter.

[0057] A pressurizing roller is a roller configured to provide high pressure on printing paper so that electrified toner may be easily fused. The pressurizing roller is pressure-welded to a heating roller and forms a nib.

[0058] The fuser driver 200 may be realized as a processor, ASIC, or CPU and the like. The fuser driver 200 may control the power being supplied to the heating element so that the heating roller has a predetermined temperature state according to the operational state of the image forming apparatus 100. For example, in response to the image forming apparatus 100 being at a printing state, the fuser driver 200 may control the power being supplied to the heating element so that the heating roller has a predetermined temperature necessary for fusing. In addition, even in response to the image forming apparatus 100 being at a waiting state or preparation state, for quick printing, the fuser driver 200 may control the power being supplied to the heating element so that the heating roller has a lower temperature than the temperature necessary for fusing.

[0059] The fuser driver 200 may control the power being supplied to the heating element in a suitable control method depending on the temperature state of the fuser 110 and the operational state of the image forming apparatus 100.

[0060] More specifically, in response to the operational state of the image forming apparatus 100 being at an initial on state (or preparation state), the fuser driver 200 may control the power being supplied to the heating element in a phase control method of avoiding a predetermined phase according to an embodiment of the present disclosure. Herein, the phase control involves performing a phase control using the AC power of sections other than the phase angle of a predetermined range on the basis of the peak power peak value of an external AC power. This will be explained in more detail with reference to FIG. 5 below.

[0061] Furthermore, in response to the operational state of the image forming apparatus 100 being at a printing state, the fuser driver 200 may perform a phase control on the power being supplied to the heating element using all sections of the AC power.